

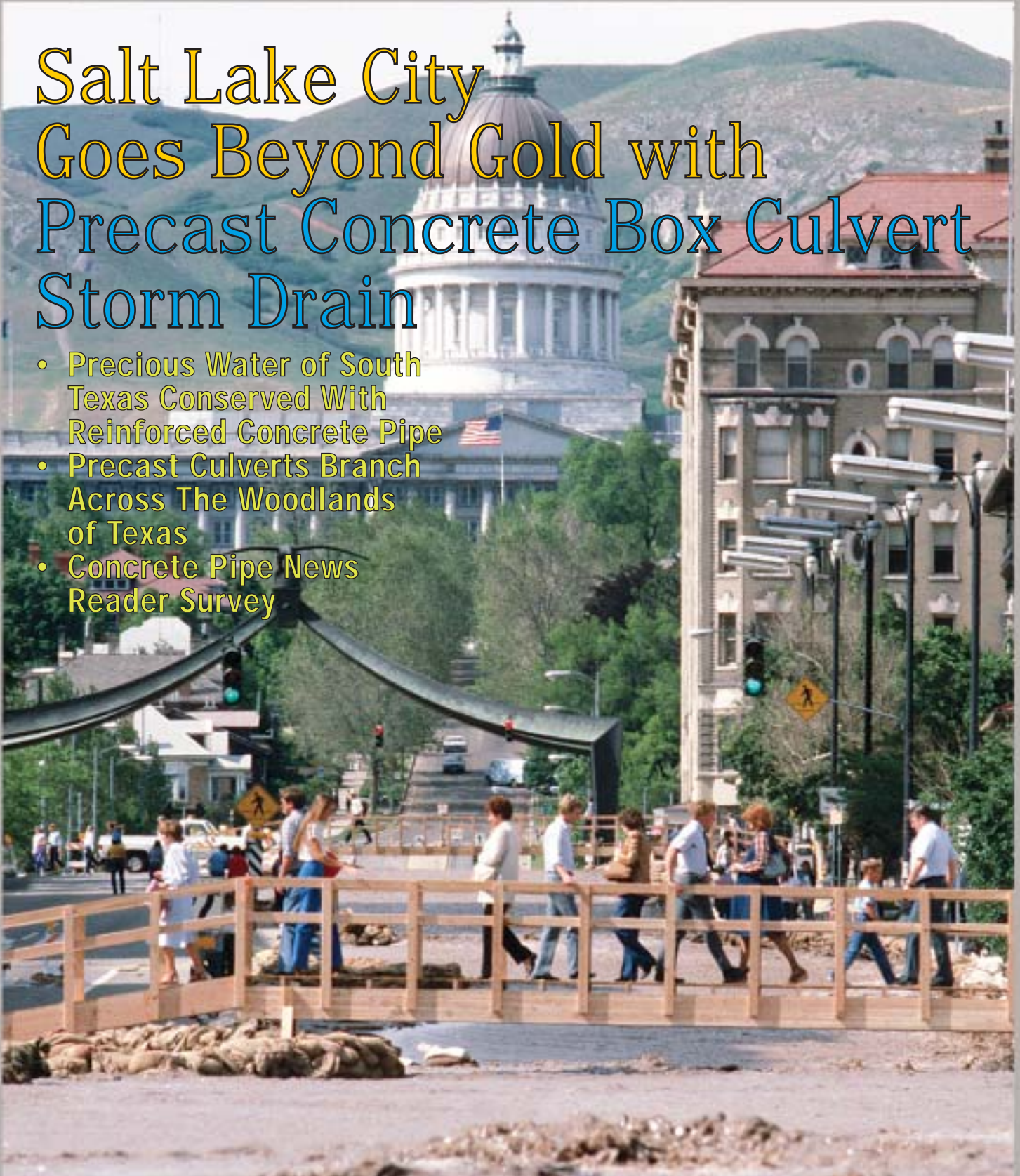
CONCRETE PIPE NEWS



The Magazine of the
American Concrete Pipe Association

Salt Lake City Goes Beyond Gold with Precast Concrete Box Culvert Storm Drain

- Precious Water of South Texas Conserved With Reinforced Concrete Pipe
- Precast Culverts Branch Across The Woodlands of Texas
- Concrete Pipe News Reader Survey



This issue:

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Concrete Pipe News is published four times each year by the American Concrete Pipe Association. It is designed to provide information on the use and installation of precast concrete pipe products for a wide variety of applications, including drainage and pollution control systems. Industry technology, research and trends are also important subjects of the publication. Readers include engineers, specifiers, public works officials, contractors, suppliers, vendors and members of the American Concrete Pipe Association.

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table of contents

Regular Departments

Education Is The Keystone Of Our Success 3

From Association President John J. Duffy

And Now You Know...

Here Today, Gone Tomorrow 4

Would You Be Willing To Pay \$46,496 Per Year For A Single Culvert Pipe?

A concrete pipe producer laments decisions taken over three decades ago to overlook life cycle cost when specifying products and materials for state highway drainage. As funds for infrastructure maintenance and the unplanned replacement of failed culverts become increasingly inadequate, municipal and highway officials must now look to life cycle cost analysis of products and materials to determine what solution is best for supporting our roadways. The cost of raw materials, the cost of fuel, and the value of time are spiraling. Future failures will be much more expensive. Can we really afford to replace our culverts after only 32 years?

Feature Story

Salt Lake City Goes Beyond Gold with Precast Concrete Box Culvert Storm Drain 6

At a cost of \$13 million at completion, the 900 South Storm Drain project is the largest stormwater project in the City's 1993 Storm Drainage Master Plan. The project will relieve overloading of several east-west storm drains, alleviate upper mid-city capacity overloading, street flooding and backwater effect at the Jordan River, and improve stormwater quality.

Stories

Precast Culverts Branch Across The Woodlands of Texas 9

Precast reinforced concrete box culverts saved substantial construction time and added value to the most recent development for The Woodlands, Texas, - the 27,000-acre master planned community located 27 miles north of Houston. Known as the Branch Crossing West extension project, construction included the water distribution system, drainage facilities, paving, and appurtenances.

Precious Water of South Texas Conserved With Reinforced Concrete Pipe 11

The Rio Grande Valley of South Texas is officially classified as semitropical and technically, it is a desert with the Rio Grande River as the only source of water. The area is irrigated with hundreds of miles of canals. The Curry Main Canal was one such canal that was open and lost water in double digit percentages to evaporation. A precast concrete pipeline, extending for almost a mile, replaced the Curry Main Canal to reduce water loss.

Concrete Pipe News Reader Survey 13

Concrete Pipe News is the premier publication of the American Concrete Pipe Association that provides technical and application news to more than 13,000 readers in the United States, Canada and other countries. Articles are often re-published in trade magazines. To keep the publication a valued product of the American concrete pipe industry, it is important to hear from the readership on how it can be improved. Please take time to respond to the survey questionnaire located in the centerfold. You could win a digital camera.

**On the Cover:
Excessive
flooding in 1983
alerted City
leaders to the
need for
stormwater
facilities.**



Cover Photo: Ravell Call

president's message

John J. Duffy



Education Is the Keystone Of Our Success

If you study to remember, you will forget, but, if you study to understand, you will remember. The author of these words of wisdom is unknown. The message, however, is very clear and reflective of the emphasis that members of the American Concrete Pipe Association (ACPA) place on education.

At a time when the concrete pipe industry was dealing with an onslaught of new thermoplastic and fiber-reinforced competitive products, and concerned about escalating losses of market share, its leaders knew that the answer to taking advantage of new market forces was education. It was not enough to solely understand concrete pipe technology better than specifiers, contractors, and regulators and then present this information in a way that some might describe as a second thought. We also knew that our collective knowledge about competitive products and materials needed to be kept current. Today, the concrete pipe indus-

try has the strongest continuing education program of its kind, focused on the technology and marketing of all buried drainage products currently available. In addition, specialized schools have been established that supply our industry with a new generation of concrete pipe production professionals and business managers.

Middle Tennessee State University (MTSU) is known for its Concrete Industry Management (CIM) program. This program is a joint initiative between MTSU and leaders from the concrete industry. It provides students with the opportunity to acquire skills to meet the growing demands of a progressive, changing concrete industry. The program has advanced to a stand-alone major. The goal of the four-year Bachelor of Science degree is to produce graduates who are:

- Broadly educated.
- Adept at oral and written communications.
- Proficient in basic math and science.
- Knowledgeable of concrete technology and techniques.
- Able to manage people and systems.
- Capable of promoting products or services related to the concrete industry.

Work is well underway by MTSU to expand the Concrete Industry Management Program through faculty of other universities in Arizona, northern California, and New Jersey.

The Associate in Applied Science Concrete Technology degree program at Alpena Community College (ACC) in Alpena, Michigan, is an intense material-based science curriculum with courses in cementitious materials, aggregates, admixtures, placed concrete, mix designs, inspection, troubleshooting, precast/prestressed, and masonry production. Due to the diverse training, graduates are highly recruited by all types of concrete industries, as well as Departments of Transportation across the United

continued on page 15

and now you know...

Here Today, Gone Tomorrow

Would You Be Willing To Pay \$46,496 Per Year For A Single Culvert Pipe?

By Jim White, P.E.

The citizens of the State of Indiana paid \$46,496 for one culvert pipe under Indiana State Route 66 in Vanderburgh County. On August 3, 2004, the Indiana Department of Transportation (INDOT) awarded an emergency contract to Blankenberger Brothers Incorporated for the replacement of a collapsed large multi-plate corrugated metal pipe arch under Route 66. The failed pipe was replaced with a 12-foot x 6-foot reinforced concrete box culvert furnished by M&W Concrete Pipe & Supply of Evansville, Indiana.



Photo: M&W Concrete Pipe & Supply

The original corrugated metal structure was installed in 1972 and lasted only 32 years before it collapsed. The culvert had begun to fail, however, long before the catastrophic failure in 2004. Corrosion and abrasion had severed the plates at the interface between the wall and the invert. The invert had been thrust upward in some locations to a point where it almost touched the top of the arch. More than 30 cubic yards of concrete was necessary to fill the void left by the collapsed pipe to make it safe for the road to remain open to travelers and

commerce while a contract was awarded for the culvert replacement.

INDOT's emergency replacement contract was for \$469,100. This accommodated the closing of the road for 10 days while the failed corrugated metal structure was replaced. Speedy delivery by M&W Concrete, along with experienced and efficient placement of the box culvert by Blankenberger Brothers, limited the closure to nine days including three days of rain delay.

The detour around the road closure exceeded 22 miles, and took approximately 30 minutes to complete. User costs resulting from this detour were high. According to INDOT, Route 66 in the location of the collapse has an average daily traffic count of 9,612 vehicles with 10% trucks. Using a formula developed by Dr. Joseph Perrin, Jr. and Chintan S. Jhaveri (research calculating the true economic costs of failures)¹ the traveling public incurred a "Delay Cost" of \$113,200 per day or \$1,018,800 for the nine-day road closure and detour.

Combining the user delay costs of \$1,018,800 and the contract cost of \$469,100 yields a total cost of \$1,487,900, or \$46,496 for each of the 32 years that this one corrugated metal structure was in the ground. That equates to over \$87 for each day in the life of the metal structure. If the unexpected collapse had resulted in a vehicle crash and/or injury leading to litigation, the annual cost borne by the citizens of Indiana would have been much higher.

The National Corrugated Steel Pipe Association's (NCSPA) *CSP Durability Guide* was used to determine the anticipated service life of the existing corrugated steel structure. Patriot Engineering and Environmental, Inc. was retained to determine the pH of the soil surrounding this structure and the water passing through it. Patriot determined the pH of the soil to be 7.5 and the pH of the water to be 7.67. This is essentially a neutral environment, and

therefore, considered ideal conditions to realize the maximum life of a corrugated metal structure. Using these values, and incorporating the *AISI Chart for Estimating Average Invert Life for Galvanized CSP* nomograph found in the *CSP Durability Guide*, then multiplying by the factor for the 10 gage metal thickness of the existing structure, one can determine the estimated average invert life of the original structure based on NCSA's recommendations. Accordingly, this structure should have lasted in excess of 195 years. In reality, even in these ideal conditions, it lasted only about 16% (32 years) of the mathematically-calculated 195 years. Even if the design engineer had used half of the predicted service life of the metal arch, he would have missed the mark by 65 years. What happened to this structure? Is this indicative of other corrugated metal structures installed during that era?



Photo: M&W Concrete Pipe & Supply

If a reinforced concrete box culvert had been used for the initial construction it would have provided a 100-year service life² and only increased the cost of the structure by approximately \$3,500. Taxpayers could have saved the replacement cost and the user delay cost of approximately \$1,487,900 by the time the corrugated metal structure failed, 32 years later. This is an incredibly poor return on investment. Taxpayers get a better return on their transportation investment when precast reinforced concrete products are used for drainage infrastructure on major highways.

A trend toward replacing corrugated metal culverts that have failed prematurely^{3, 4}, or collapsed suddenly at the end of their service life has been developing for many years in southern Indiana and

other parts of the country. Corrugated metal structures installed in the 1960s and 1970s are failing with alarming regularity. The vast majority of cross drains that were installed with the original construction of Interstate 64 in southern Indiana have already required rehabilitation by slip lining to prevent complete failure. Slip lining is always much more expensive than the cost of the original structure. It is estimated that the recent cost of rehabilitation of only two or three of these structures would have more than paid for the total cost to install the 100-year precast reinforced concrete pipe as a part of the original construction of Interstate 64. Costs of slip lining or replacement of corrugated metal culverts becomes an even larger burden for the states because the federal government paid for 90% of the original interstate construction and a much lesser, if any, portion of the rehabilitation or replacement costs. As funds for infrastructure maintenance and the unplanned replacement of failed culverts become increasingly inadequate, municipal and highway officials must look to life cycle cost analysis of products and materials to determine what solution is best for supporting our roadways. This analysis should recognize the potential cost of detours and lost business in the event of catastrophic failure. The cost of raw materials, the cost of fuel, and the value of time are spiraling. Future failures will be much more expensive. Can we really afford to replace our culverts after only 32 years? A new Interstate 69 is currently being designed through Indiana. Perhaps there is an awakening brought on by technology, and an awareness of the need for sustainable infrastructure characterized by precast concrete pipe and boxes. All of us have to realize that in the long run, the generations that follow get what we pay for. ☺

1. Perrin, Joseph Jr. and Chintan S. Jhaveri, *The Economic Costs of Culvert Failures*, prepared for Transportation Research Board, January 2004.
2. United States Army Corps of Engineers, *Engineering and Design, Conduits Culverts, and Pipes (EM 1110-2-290)*, Washington, DC, March 1998
3. I-70 Colorado, 2003
4. I-75 Michigan, 2003

Jim White, P.E. is the General Manager of M&W Concrete Pipe & Supply of Evansville Indiana, a member firm of the American Concrete Pipe Association.

Feature Story

Salt Lake City Goes Beyond Gold with Precast Concrete Box Culvert Storm Drain

Installation of 12-foot x 5-foot section
of box culvert storm drain.

By Randy Wahlen, P.E.
Mountain States Concrete Pipe
Association
801-942-7552

Projects of Olympian proportions are no stranger to Salt Lake City, Utah. At a cost of \$13 million at completion, the 900 South Storm Drain project is the largest stormwater project in the City's 1993 Storm Drainage Master Plan. The project will relieve overloading of several east-west storm drains, alleviate upper mid-city capacity overloading, street flooding and backwater effect at the Jordan River, and improve stormwater quality. The storm drain project provided the opportunity to reconstruct and enhance the beauty of portions of 900 South, one of the earliest streets to be paved in Salt Lake City, and a major boulevard that was showing the wear and tear of age. The project was completed using more than two miles of precast concrete boxes and concrete pipe.

Snow pack in the nearby mountains was 489

Photo: Dannie Pollock

percent above normal on June 1, 1983. While unusually cold spring weather prevented a gradual spring melting, normal June temperatures brought extensive flooding that alerted City leaders to the importance of, and need for stormwater facilities. Major stormwater capital improvements were soon planned, but funding of the works stalled construction until 1991 when the City became one of the first in the Nation to create a stormwater utility. The utility became a key source of revenue for funding stormwater quality programs that had to be implemented to meet regulations of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. In 1993, Salt Lake City developed a Storm Drainage Master Plan that identified 89 separate projects estimated to cost \$70 million in 1993 dollars.

The Act established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave the Environmental Protection Agency (EPA) the authority to implement pollution control programs, such as setting wastewater standards for the industry. The Clean Water Act also continued requirements to set water quality standards for all contaminants in surface waters. The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants with the construction grants program, and recognized the need for planning to address the critical problems posed by non-point source pollution.

CH2M HILL initiated project planning and

design in 1995, and on May 17, 2004 construction began on the 900 South Storm Drain Project. The project ultimately will convey 208 cubic feet per second of urban runoff from the Liberty Park area to the Jordan River in a precast concrete box culvert. Construction of the project was awarded to Rolfe Construction Co. and divided into two phases. The first phase consisted of 4,700 feet of 12-foot x 5-foot box culvert from the Jordan River to 400 West. The second phase is comprised of 1000 feet of 12-foot x 5-foot box culvert and 2,650 of 9-foot x 5-foot box culvert from 400 West to State Street. The future Phase 3, to bid in the spring of 2005, consists of 6,800 feet of 66-inch diameter reinforced concrete pipe.

The location and depth of existing utilities within city streets and the flat grade of



Photo: Randy Wahlen

Only three inches of road base separated the box culvert storm drain from the asphalt in certain locations.

the project alignment were critical design considerations. Mr. Dannie Pollock, of CH2M HILL, indicated that, "To avoid a major portion of utility conflicts and obtain the needed capacity, a concrete box culvert placed under shallow cover was the ideal solution. With only three inches of road base separating the

Feature Story

box culvert from the asphalt in certain locations, there was little room for error in design and construction.”

A one-acre wetland stormwater treatment facility was constructed at the outfall of the culvert before discharging into the Jordan River. This facility serves as the end-of-line treatment of the stormwater to enhance the quality of the discharge to the river to meet EPA and the Clean Water Act regulations. Additional features of the project included a low maintenance 66-inch reinforced concrete pipe direct bored siphon at State Street to facilitate construction and tight specifications to ensure that construction met the rigid requirements of the City.

A key success of the project was a proactive public outreach program with financial incentives paid to the contractor to lessen the impact on those residing in the vicinity of the project. Since the project impacted several residents and businesses, the contractor was required to keep the public informed of construction activities and coordinate every aspect of the project with a Citizens Advisory Committee that was responsible for evaluating the contractor's incentive bonuses. Asked about the public outreach program, Mr. Kim Rolfe of Rolfe Construction said, “Salt Lake City has some tough construction requirements for this project. We found the precast box culvert to be up to the test in meeting these requirements. Box culvert construction efficiency has exceeded those which were planned.”

Through the bidding process, it became clear that the precast concrete box culvert was significantly lower in cost than a comparable cast-in-place concrete box storm drain alternative. The precast concept also minimized impacts to the public. Savings are realized when access to roadways, businesses and residences, and public outreach is stressed as major items of concern during the bid process. When constructing buried infra-

structure in a built-up area of a city, the speed of installing precast concrete drainage products translates into significant cost savings and positive public involvement.

The 2002 Salt Lake City Olympics have now passed into history, along with the excitement of the games. Nevertheless, the City continues to build extraordinarily demanding infrastructure detailed in its 1993 Storm Drainage Master Plan that will provide a greater service to its citizens than any world-class sports event. ☺

Project:	900 South Storm Drain Project Salt Lake City, Utah
Owner:	Salt Lake City Department of Public Utilities
Engineers, Project Manager:	CH2MHILL Salt Lake City, Utah
Contractor:	Rolfe Construction Co. Sandy, Utah
Producer:	Amcors Precast (a division of Oldcastle Precast, Inc.) Ogden, Utah
Quantities:	5,700 feet of 12-foot x 5-foot x 5-foot reinforced concrete box sections 2,650 feet of 9-foot x 5-foot reinforced concrete box sections 6,800 feet of 66-inch diameter reinforced concrete pipe (Phase 3) 280 feet of 66-inch and 30-inch diameter reinforced concrete pipe - State Street Siphon

Amcors Precast's Ogden facility has been in service for more than 50 years. Along with a complete line of concrete pipe and manhole products, Amcors also produces utility vaults, catch basin products, box sections, and a wide variety of other precast concrete products. See www.oldcastle-precast.com.



Photos: Edwin J. Jackson

Precast Culverts Branch Across The Woodlands of Texas

By Edwin J. Jackson • Conroe Pipe, Inc. • 936-760-2259

Precast reinforced concrete box culverts saved substantial construction time, and added value to the most recent development in The Woodlands, Texas, the 27,000-acre master planned community located 27 miles north of Houston, Texas. Known as the Branch Crossing West extension project, construction included the water distribution system, drainage facilities, paving, and appurtenances. The 1,200-foot long project is the missing segment on Woodlands Parkway between Portrait Garden Drive in Sterling Ridge and transportation route FM 2978. It will improve the transportation system for motorists going to Tomball, Magnolia, Houston and other points north, south and west of The Woodlands. The extension of Woodlands Parkway is also expected to offer an alternate route to Interstate 45 from the Tomball and Magnolia areas, and it is likely to add more cars and trucks to this major thoroughfare. The new extension scheduled to open in early 2005 is expected to add about 7,000 to 8,000 vehicles per day to Woodlands Parkway, which carries 40,000 cars daily.

The Branch Crossing project was developed by LJA Engineering & Surveying, Inc. in cooperation with The Woodlands Operating Company, L.P. to expand the roadways and infrastructure. This is the most recent phase of development for the Village of Ster-

ling Ridge subdivision of The Woodlands.

The first phase of the stormwater management component of the project started with 220 linear feet of a triple barrel run of 9-foot x 5-foot box culvert that used 54-inch diameter reinforced concrete pipe equalizers to maintain flow balance in each line. The south barrel transitioned to 60-inch diameter reinforced concrete pipe for stormwater runoff from a future department store. The other two barrels turned northwards along a 700-foot radius curvature of the roadway for a distance of 500 feet, then back towards an existing 9-foot x 5-foot double barrel run. Along this run, two flow line changes



Precast concrete box sections used for double, triple, and quadruple culverts.

of 2 feet between inverts occurred. To achieve these elevation changes vertical precast bends were installed. Eighteen horizontal precast bends were used to achieve the roadway curve and alignment requirements.

A 125 linear foot cross culvert of 10-foot x 4-foot box sections with less than two feet of earth cover and a 36-inch trunk line inlet comprised the second phase. The third phase was a 195 linear foot quadruple barrel cross culvert of 10-foot x 10-foot box sections with skewed headwalls parallel to the roadway.



Installation of precast concrete box culverts with 54-inch diameter reinforced concrete pipe equalizer.

The Woodlands Operating Company, L.P. awarded the bid to construct Branch Crossing to C.E. Barker Construction, Ltd. of Magnolia, Texas in the spring of 2004. At that time, Conroe Pipe, Inc. of Conroe, Texas was contracted to supply the precast concrete box sections and reinforced concrete pipe.

Development of The Woodlands began in the mid-1960s with George P. Mitchell. To diversify company assets during an energy downturn, Mitchell Energy & Development Corp. paid \$125 an acre (\$6.25 million) for this 27,000-acre package. Later in the decade Mitchell Energy & Development Corp. added value to the purchase by selling annual timber rights to Louisiana Pacific. This brought the purchase price per acre closer to \$40 from the original \$125. Today, 1/2-acre subdivision lots are valued at \$5,000 to \$20,000. Although income from The Woodlands comprised nearly 20% of its rev-

enue, Mitchell Energy & Development Corp. sold all assets to The Woodlands Operating Company, L.P. in 1997.

The Woodlands community is located in the woods just minutes north of Bush Intercontinental Airport. It is so well planned that it has been called an invisible city with a population over 75,000 and a potential of 125,000. ☺

Project:	Woodlands Parkway Extension The Woodlands, Texas
Owner:	The Woodlands Operating Company, L.P. The Woodlands, Texas
Consultant:	LJA Engineering & Surveying, Inc. Houston, Texas
Contractor:	C.E. Barker Construction, Ltd. Magnolia, Texas
Producer:	Conroe Pipe, Inc. Conroe, Texas
Quantities:	365 feet of 9-foot x 5-foot reinforced concrete box sections 17 feet of 10-foot x 4-foot reinforced concrete box sections 128 feet of 10-foot x 10-foot reinforced concrete box sections Four (9-foot x 5-foot) reinforced concrete box sections with 54-inch pipe equalizers Eighteen (9-foot x 5-foot) reinforced concrete box sections with prefabricated horizontal bends Eight (9-foot x 5-foot) reinforced concrete box sections with prefabricated vertical bends 24 feet of 60-inch diameter Class III reinforced concrete pipe 10 feet of 54-inch diameter Class III reinforced concrete pipe 160 feet of 48-inch diameter Class III reinforced concrete pipe 136 feet of 36-inch diameter Class III reinforced concrete pipe 240 feet of 30-inch diameter Class III reinforced concrete pipe

The Conroe Pipe, Inc. plant is located in Conroe, Texas servicing the southeast Texas region with quality precast concrete pipe and boxes. Contact: Conroe Pipe, Inc., P. O. Box 3007, Conroe, TX, 77305, cpi-ed@consolidated.net.

Precious Water of South Texas Conserved With Reinforced Concrete Pipe

By Michael Lopez • W.T. Liston Co. • 956-797 3227

In recent years, Hidalgo County Irrigation District No. 1 found itself with a shortage of water. Since the Irrigation District could not simply pump more water out of the Rio Grande River, the answer was found in water conservation.

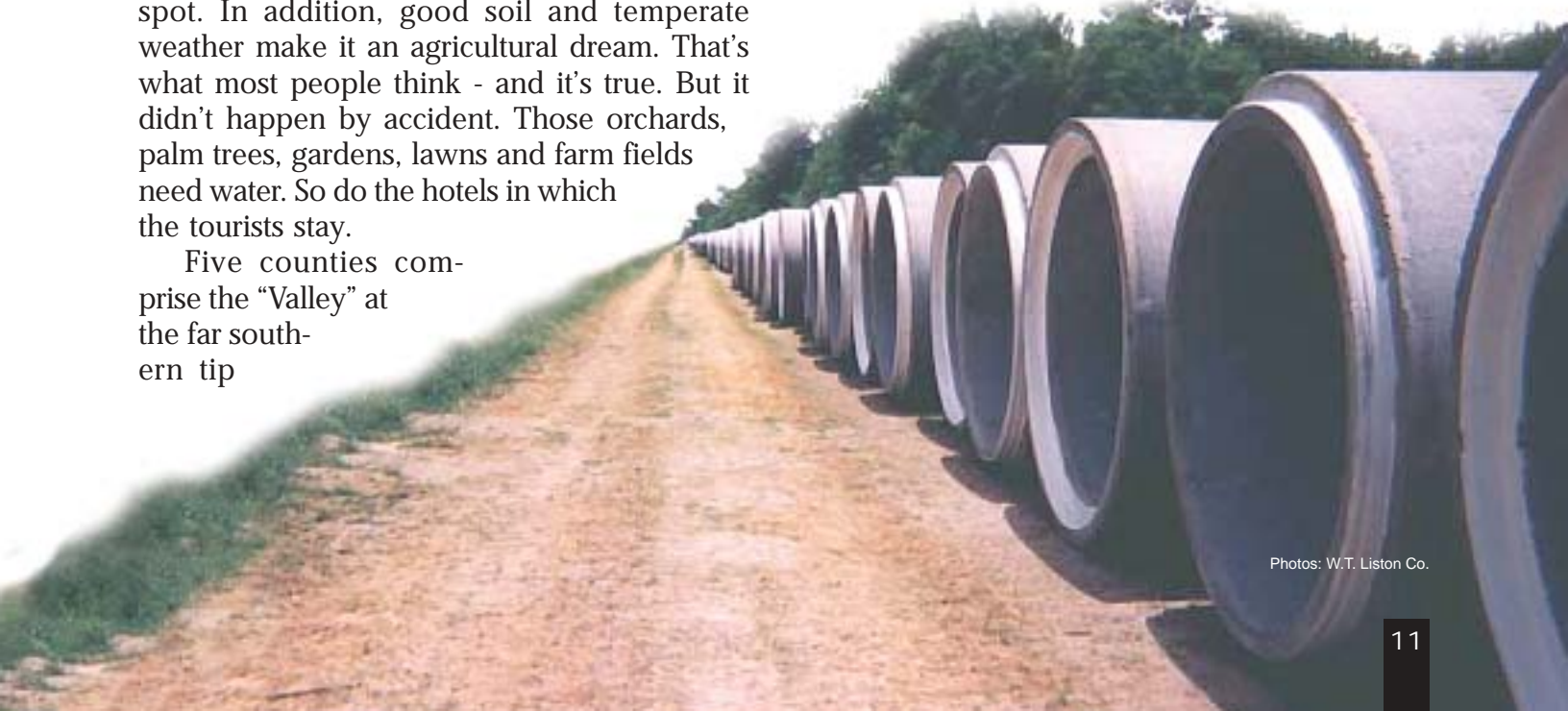
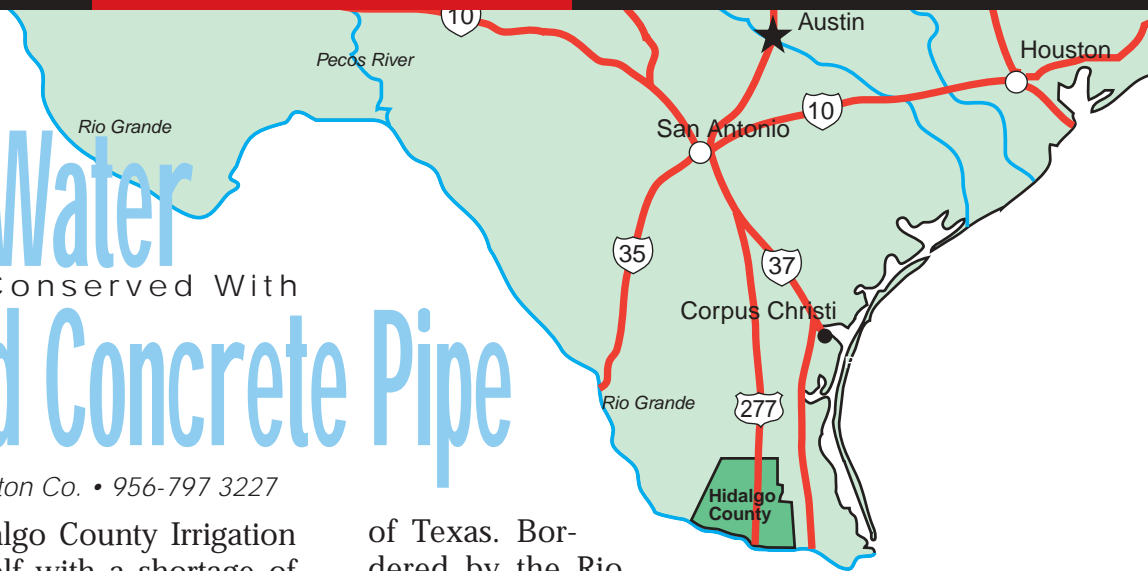
The Curry Main Canal was an open canal that lost water in double digit percentages, due to evaporation and seepage. This was a loss that the District could not afford. It hired Melden and Hunt Engineers, one of the premier water and drainage engineering firms in the area to design and oversee a project to enclose the water supply carried by the canal.

The Rio Grande Valley of South Texas is a lush tropical territory filled with orange and grapefruit orchards, hundreds of palm trees, beautiful gardens, and lawns so green they make your eyes hurt. Endless beaches, the proximity to Mexico and more sunny days each year than Florida, make the valley a prime vacation spot. In addition, good soil and temperate weather make it an agricultural dream. That's what most people think - and it's true. But it didn't happen by accident. Those orchards, palm trees, gardens, lawns and farm fields need water. So do the hotels in which the tourists stay.

Five counties comprise the "Valley" at the far southern tip

of Texas. Bordered by the Rio Grande River and Mexico to the South and the Gulf of Mexico to the east, it is a massive delta formed over centuries of flooding by the Rio Grande. The area is officially classified as semitropical. Technically, it is a desert with the Rio Grande River as the only source of water.

To convey water from the Rio Grande River to where it is needed, the Valley depends upon an irrigation system unparalleled in the United States. Hundreds of miles of canals, pipelines and ditches move water from pumping stations on the river to points of use up to 35 miles away. It is a good system that is cost effective, efficient and easily maintained, but it is not a perfect system. The open ditches and canals are not efficient in preventing water loss. The problem worsens in the case of drought, like the current one which has persisted for eleven years!



Photos: W.T. Liston Co.



Installation of 72-inch diameter reinforced concrete pipe to carry irrigation water.

Larry Smith, P.E., of Melden and Hunt was the lead engineer who worked closely with the District to ensure a successful project. He designed a precast concrete pipeline extending for almost a mile that would replace the Curry Main Canal. Adding to the complexity of the job was a limited right of way, and the District's requirement for water deliveries which led to a very tight timeline. The engineer specified 72-inch diameter reinforced concrete pipe (RCP) due to its flow capacity, inherent strength, and a watertight installation. One of the area's most experienced pipe line contractors, McAllen Construction, was contracted to install the pipe, and W.T. Liston Co. was selected by the contractor to supply it.

W.T. Liston Co. followed the carefully considered specifications for pipe production provided by Melden and Hunt.

- Every bell and every spigot of the 72-inch diameter RCP was tested by go-no-go gauges.
- One pipe per 100 produced was D-load tested to ASTM C76 Class III specification.

- One pipe per 100 was hydrostatic tested to thirty feet of head.
- One pipe per 200 produced was cored for inspection.

Close cooperation between the engineers and the producer ensured that there were no failures of the product in the plant.

Installation specifications were in place and followed by the contractor McAllen Construction. In spite of limited working room and a very tight installation timetable, McAllen was able to install, test and bring the line into service almost four months ahead of schedule. As testimony to the ability of the engineers and contractors, not one leak in the pipe has been reported in all 4,536 feet of C wall 72-inch diameter reinforced concrete pipe. ☺

Project:	Curry Main Project Hidalgo County, Texas
Owner:	Hidalgo County Irrigation District No. 1 Edinburg, Texas
Consulting Engineer:	Melden and Hunt, Inc. Larry Smith, P.E. Edinburg, Texas
Contractor:	McAllen Construction Howard Pebbly McAllen, Texas
Producer:	W.T. Liston Co. Michael Lopez La Feria, Texas
Quantities:	4,536 feet of 72-inch diameter C361/R4 RCP

W.T. Liston Co. has been in business since 1919, supplying the Rio Grande Valley of South Texas with high quality concrete pipe. In addition to concrete pipe Liston manufactures a wide range of precast concrete products including manholes, inlet boxes, catch basins and septic tanks. Now under its fourth generation of family management, the company continues to strive to improve the quality and value of all of its products. The company is a long-time member of the American Concrete Pipe Association.



Concrete Pipe News Reader Survey

To provide you with the most interesting and useful information, we need your input. Please take a few moments to complete the following survey and return it to us by fax, mail or online at www.concrete-pipe.org.

All surveys returned by May 31, 2005 will be eligible to win a digital camera*.

Name: _____

Company/Government Agency: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Email: _____

- I work for: engineering firm contractor government agency concrete pipe manufacturer
I am involved with (*check all that apply*) design/specifying construction company management
- How many years have you been specifying/installing pipe products?
 1 – 5 years 6 – 10 years 11 – 15 years 16 – 20 years over 20 years
- Of the 4 issues of *Concrete Pipe News* published annually, how many issues do you typically read?
 4 issues 3 issues less than 3 issues don't review
- In general, how would you characterize the content of the articles? (*Check all that apply*)
 of interest to pipe producers of interest to consulting engineers of interest to contractors
 of interest to government officials of interest to all readers
- Over the past four issues, please check the number of times you read the following.

	Read 3 or 4	Read 1 or 2	Rarely read	Never read
President's Message				
Industry Spotlight Interview				
Feature Story				
Project Stories				
Back cover update				

- What do you do with *Concrete Pipe News* when you are finished with them?
 Pass on to co-workers Save as reference material Discard
- Please list the top 3 trade publications your read most often to learn about the pipe industry.

- How likely are you to investigate precast concrete pipe and box applications based on information you read in *Concrete Pipe News*?
 Very likely Likely Not likely
- I would like to see more information on: _____

- Additional Comments / A colleague you would like to see added to the mailing list: _____

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If Mailing, Fold Here and Tape At Bottom!

***Digital Camera Prize Drawing – Official Rules**

The winning survey will be drawn at random from all entries submitted. It is not necessary to complete the questionnaire to enter into the drawing. Contact information must be completed in order to enter into the drawing. Prize is not transferable. The retail value of the Kodak 6.1 MP EasyShare DX7630 digital camera is \$317.00. The odds of winning depend on the number of entries received. The winner is responsible for all applicable income taxes. The drawing is void where prohibited by law. All federal, state, and local laws and regulations apply. The contest period runs from April 15 to May 31, 2005. The drawing is sponsored by the American Concrete Pipe Association (ACPA). Winners will be notified by telephone or email. The drawing will be held in June, 2005 by ACPA at their headquarters location and all inquiries regarding this drawing should be directed to American Concrete Pipe Association, 222 W. Las Colinas Blvd., Suite 641, Irving, TX 75039-5423.



president's message continued from page 2 _____

States. An enhancement of the program occurred when Lake Superior State University (LSSU) and Alpena Community College entered into an agreement allowing a graduate from ACC's two-year Concrete Technology degree to complete a Bachelor of Science degree in Business Administration through LSSU's off-site program in Alpena.

The World Center for Concrete Technology (WCCT) is a \$7 million facility on the Alpena Community College campus that contains the most current technology for concrete education and research. It was designed to advance the interests of concrete and concrete products industries by offering workforce development and training programs, research services, certified testing facilities and academic degree programs. WCCT also offers the Blockmakers Workshops series that local concrete products and plant equipment manufacturer, Besser Co., in partnership with Alpena Community, has sponsored for several decades. Students enrolled in the World Center for Concrete Technology may pursue an advanced degree through LSSU.

The American Concrete Pipe Association's Production and Fall Short Course Schools and Concrete Pipe University (that offers specific courses throughout the year), demonstrate the importance that ACPA members place on continuing education. The Fall Short Course School is an informative two-day educational event designed to assist technical sales and marketing engineers to learn more about the design, specification, and use of piping products for sanitary sewers, storm drain applications, and culverts. Industry experts bring personal knowledge and practical experience to each session covering concrete pipe, homeland security, box culverts, manholes, true cost of ownership, service lives of various drainage materials, and other related topics. Up to 1.9 continuing edu-

cation units are offered, to help fulfill the continuing education requirements of professional engineers. Designers and specifiers outside of the industry are also provided a unique opportunity to learn about the sanitary and storm drainage business.

At the Fall Short Course School in November 2004, more than 250 concrete pipe industry professionals, including guests from DOTs, consulting engineering firms, construction companies, and governments convened in Las Vegas to learn about reinforced concrete pipe production, durability, specifications, flexible pipe attributes, software development, and emerging pipe materials.

In February 2005, over 240 industry personnel gathered in Indianapolis to attend the Production Short Course School. There, seminars were offered on leadership, production, quality, and plant safety. The school featured machinery clinics, plant tours, and safety awards.

The American Concrete Pipe Association and its members have learned how to become life-long students of buried pipe technology, as well as economic and political forces that impact the application of all pipe, regardless of the material from which drainage products are made. Concrete pipe industry production personnel, marketers, sales representatives, and managers have learned to know as much about the science and marketing of competitive products as they do about concrete pipe. Specialized schools in Michigan and Tennessee, as well as established continuing education programs of the ACPA, are fielding knowledgeable concrete pipe industry representatives who know their business. This can only bode well for an enlightened society that understands the value of its buried infrastructure. ☺

*Our progress as a nation can be no swifter
than our progress in education.*

John F. Kennedy



SHOPPING FOR PRECAST CONCRETE PIPE TOOLS & INFORMATION

For information on precast concrete pipe, visit www.concrete-pipe.org. There, you will find information such as *Design Data* publications on a variety of topics, Fill Height Tables, and the *Concrete Pipe Design Manual*. In addition, there are a variety of brochures including *Buried Facts*, *CP Insights*, *Dispatches*, videos and "You



Should Know" bulletins. All of these technical and marketing products are available either at no charge or for a nominal fee. Materials may be ordered through the ACPA Resource Center. You may place your orders online, by telephone, or mail. Contact the ACPA Resource Center at 800-290-2272. ☺



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www.concrete-pipe.org

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